ABSTRACT

A method of making films surface imprinted with nanometer-sized particles to produce micro- and/or nano-structured electron and hole collecting interfaces, include providing at least one transparent substrate, providing at least one photoabsorbing conjugated polymer, providing a sufficient amount of nanometer-sized particles to produce a charge separation interface, providing at least one transparent polymerizable layer, embedding the nanometer-sized particles in the conjugated polymer, applying the polymerizable layer and the conjugated polymer/nanometer-sized particle mixture on separate substrates where the nanometer-sized particles form a stamp surface, imprinting the stamp surface into the surface of the polymerizable film layer to produce micro- and/or nano-structured electron and hole collecting interfaces, polymerizing the polymerizable film layer to form a conformal gap, and filling the gap with at least one photoabsorbing material to promote the generation of photoexcited electrons and transport to the charge separation interface.